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09/750,058	12/29/2000	Christian Georg Gerlach	Q62288	7011

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SUGHRUE, MION, ZINN, MACPEAK & SEAS, PLLC
2100 Pennsylvania Avenue, N.W.
Washington, DC 20037-3213

EXAMINER	
PERILLA, JASON M	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/750,058	Applicant(s) GERLACH, CHRISTIAN GEORG	
	Examiner Jason M Perilla	Art Unit 2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 May 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8 and 12-15* is/are rejected.

7)☒ Claim(s) *9-11* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 December 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-15 are pending in the instant application.

Response to Arguments/Amendments

2. Applicant's arguments, see pages 9-14, filed May 20, 2004, have been fully considered and are persuasive in view of the amendments to the claims. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made.

Claim Objections

3. In claims 5-7, "claim 1, the" should be replaced by –claim 1, wherein the--.

4. Claim 9, lines 3-4; "a second moment which occurring" should be replaced by –a second moment occurring--.

5. In claims 12, "claim 1, the" should be replaced by –claim 1, wherein the--.

6. Claim 12, lines 2-3; "a block length a number of blocks used for" should be replaced by --a block length used for--.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claim 11 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 11, the arguments/variables used in the equation must be clearly defined in the claim itself. Claim 11 is found to be indefinite because the terms used in the equation to limit the claim are not defined in the claim itself. ***All***

of the variables in the equation must be defined. *Further, the definition of z as a decision variable does not help to make the claim definite.* The definition of z as *a decision variable* does not clearly relate to any of the limitations in claim 9 or any of its parent claims. Likewise, the definition of a variable as a conjugated complex variable does not define such a variable to make it definite. It is noted that definitions of variables making them definite would lack the word "variable".

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 1-6 and 12-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohkubo et al (US 6021165; hereafter Okhubo) in view of Cahill (US 5150384) and in further view of Mourot et al (US 5537438; hereafter "Mourot").

Regarding claim 1, Ohkubo discloses a method for detecting an information signal, a tone of a specified frequency, or a phase change of the tone in a signal which contains the information signal or the tone (fig. 1; col. 1, lines 5-10) the method comprising: transforming sample values of the signal from the time domain to the frequency domain (fig. 1, ref. 6; col. 4, lines 1-2), to produce at least one output value; and detecting the information signal, the tone or the phase change based on said at least one output value (col. 4, lines 4-8). Ohkubo

discloses a method of receiving a signal that has a plurality of carriers or tones present (an OFDM signal) that are phase shift key (PSK) modulated (col. 2, line 62 – col. 3, line 7). Further, a disclosure is made that the signal is sampled in the time domain and transformed into the frequency domain. The symbol decisions are made according to the output of the transformation of the time domain samples into the frequency domain. Ohkubo does not disclose dividing the signal into time segments (blocks) and selecting a predetermined number of the blocks to be processed for detection, wherein the blocks which are not selected are not further processed. However, Cahill teaches a time division multiplex access (TDMA) system where the data received has been portioned into blocks (fig. 4). The receiver system of Cahill is designed so that each receiver in the system would only respond to and process blocks that are designated to it (col. 4, lines 25-30). The blocks that are not designated to be received by the receiver are not further processed. Cahill further teaches that the TDMA method can be advantageous because a greater number of information signals may be transmitted in a particular frequency band (col. 4, lines 17-20). For instance, Cahill teaches that in a cellular phone TDMA system, many phones may be able to use the same frequency (col. 4, lines 20-25). One skilled in the art understands the advantages of using a TDMA modulation system. Therefore, it would have been obvious for one of ordinary skill in the art at the time which the invention was made to utilize the TDMA modulation method where a received signal is divided into blocks as taught by Cahill in the receiver method of Ohkubo

because the system of Ohkubo could be advantageously modified to allow for multiple users to use the same carrier frequency.

Further regarding claim 1, Ohkubo in view of Cahill do not disclose that the blocks have an adjustable length which is set to ensure accurate detection of the information signal. However, Mourot teaches a method wherein a block length is advantageously adapted to ensure accurate detection of the information signal (col. 2, lines 15-23). Mourot teaches a method wherein the block length is adaptively changed to ensure accurate detection of the information signal by determination of the channel impulse response in a TDMA system (col. 2, lines 55-67). Further, Mourot teaches that the adaptive block length can be used to overcome problems related to intersymbol interference (col. 1. lines 13-17). Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to utilize an adaptive block length to ensure accurate detection of information as taught by Mourot in the method of Ohkubo in view of Cahill because it could advantageously be used to overcome intersymbol interference.

Regarding claim 2, Ohkubo in view of Cahill and in further view of Mourot disclose the limitations of claim 1 as applied above. Further, Ohkubo discloses that said detecting comprises mapping a plurality of output values for the selected blocks, and generating a decision value based on a result of said mapping. Ohkubo discloses that the output values of the transformation of a plurality of selected blocks are mapped by a function or mapping in at least one result, and in that the result is used to produce a decision value (col. 3, lines 1-7).

Regarding claim 3, Ohkubo in view of Cahill and in further view of Mourot disclose the limitations of claim 1 as applied above. Further, Ohkubo discloses that the mapping comprises a summation of the output values (col. 3, line 8).

Regarding claim 4, Ohkubo in view of Cahill and in further view of Mourot disclose the limitations of claim 1 as applied above. Further, Ohkubo discloses that the mapping comprises a product of the output values (col. 4, lines 21-27).

Regarding claim 6, Ohkubo in view of Cahill and in further view of Mourot disclose the limitations of claim 1 as applied above. Further, Ohkubo discloses that a Fourier transform is used (fig. 1, ref. 6).

Regarding claim 12, Ohkubo in view of Cahill and in further view of Mourot disclose the limitations of claim 1 as applied above. Further, Mourot discloses that the block length used for detection is adjusted as a function of the signal/noise ratio (SNR) of the signal so that a substantially constant error rate of detection is achieved over a range of signal/noise ratios (col. 1, lines 20-33; col. 2, lines 15-23; col. 2, lines 35-48).

Regarding claim 13, Ohkubo in view of Cahill and in further view of Mourot disclose the limitations of claim 1 as applied above. Further, Cahill discloses that a plurality of channels are processed in a time-division multiplex with offset blocks (fig. 4).

Regarding claim 14, Ohkubo discloses a device for detecting an information signal, a tone, a phase change of a the tone in at least one signal which contains the information signal or the tone (fig. 1; col. 1, lines 5-10), the device comprising: a analog-to-digital converter (fig. 1, ref. 5) for converting the

signal into a plurality of sample values. Ohkubo discloses a device for receiving a signal that has a plurality of carriers or tones present (an OFDM signal) that are phase shift key (PSK) modulated (col. 2, line 62 – col. 3, line 7). Further, a disclosure is made that the signal is sampled in the time domain and transformed into the frequency domain. The symbol decisions are made according to the output of the transformation of the time domain samples into the frequency domain. Ohkubo does not disclose dividing the signal into time segments (blocks) and selecting a predetermined number of the blocks to be processed for detection, wherein the blocks which are not selected are not further processed. However, Cahill teaches a time division multiplex access (TDMA) system where the data received has been portioned into blocks (fig. 4). The receiver system of Cahill is designed so that each receiver in the system would only respond to and process blocks that are designated to it (col. 4, lines 25-30). The blocks that are not designated to be received by the receiver are not further processed. Cahill further teaches that the TDMA device can be advantageous because a greater number of information signals may be transmitted in a particular frequency band (col. 4, lines 17-20). For instance, Cahill teaches that in a cellular phone TDMA system, many phones may be able to use the same frequency (col. 4, lines 20-25). One skilled in the art understands the advantages of using a TDMA modulation system. Therefore, it would have been obvious for one of ordinary skill in the art at the time which the invention was made to utilize the TDMA modulation system where a received signal is divided into blocks as taught by Cahill in the receiver method of Ohkubo because the system of Ohkubo could be

advantageously modified to allow for multiple users to use the same carrier frequency.

Further regarding claim 14, Ohkubo in view of Cahill do not disclose that the blocks have an adjustable length which is set to ensure accurate detection of the information signal. However, Mourot teaches a device wherein a block length is advantageously adapted to ensure accurate detection of the information signal (col. 2, lines 15-23). Mourot teaches a system wherein the block length is adaptively changed to ensure accurate detection of the information signal by determination of the channel impulse response in a TDMA system (col. 2, lines 55-67). Further, Mourot teaches that the adaptive block length can be used to overcome problems related to intersymbol interference (col. 1. lines 13-17). Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to utilize an adaptive block length to ensure accurate detection of information as taught by Mourot in the device of Ohkubo in view of Cahill because it could advantageously be used to overcome intersymbol interference.

Regarding claim 15, Ohkubo in view of Cahill and in further view of Mourot disclose the limitations of claim 15 as applied above. Further, Ohkubo discloses an FTT processor (fig. 1, ref. 6; col. 3, line 67- col. 4, line 2) which obtains the data from the received signal. It is inherent that the FFT processor comprises a memory device and a control device which during operation supplies data contained in the memory device concerning tones to be detected to the detector which generates an output signal indicating whether the tone or the phase

change has been detected. The FFT processor is used to transfer the digital samples which represent a signal in the time domain to a signal in the frequency domain. It is necessary for the FFT processor to have a memory device and a control device so that the received signal frequency spectrum may be compared by the control device with a known tone stored in the memory to be able to detect a tone or phase change.

11. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohkubo in view of Cahill, in further view of Mourot, and in further view of Chen (US 5729577).

Regarding claim 5, Ohkubo in view of Cahill and in further view of Mourot disclose the limitations of claim 1 as applied above. Ohkubo in view of Cahill and in further view of Mourot do not disclose that the transformation is frequency selective and has been adjusted to the frequency of the tone currently to be detected. However, Chen teaches a receiver that utilizes a Fourier transform (col. 1, lines 20-35). Chen further teaches that Fourier transform calculations are intensive and require expensive digital signal processing (DSP) chips (col. 1, lines 40-47). The method of Chen teaches a frequency selective Fourier transform method to reduce the number of calculations required and hence the cost of the method (col. 1, lines 48-51) by performing a Fourier transform only over the frequencies that may be observed (col. 5, line 32). Therefore, it would have been obvious for one of ordinary skill in the art at the time which the invention was made to utilize the selective frequency Fourier transform method as taught by Chen in the receiver method of Ohkubo in view of Cahill and in

further view of Mourot because it leads to the use of less calculations and a cheaper implementation of the method.

12. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohkubo in view of Cahill, in further view of Mourot, and in further view of Yonge III (US 6111919).

Regarding claim 7, Ohkubo in view of Cahill and in further view of Mourot disclose the limitations of claim 1 as applied above. Ohkubo in view of Cahill and in further view of Mourot do not disclose that the transforming comprises multiplying the sample values of selected blocks by a window function and then applying a Fourier transform to the sample values multiplied by the window function. However, Yonge III teaches a method for receiving OFDM signals using a rectangular, or preferably, a Hamming window to further aid in the reception of a signal in the presence of a jamming or noise signal (fig. 14, ref. 152; col. 6, line 49 – col. 7, line 4). Yonge III teaches that the use of a Hamming window or block is the most advantageous because it produces a frequency domain peak that is more narrow than a rectangular filter and hence, the signals can be more clearly resolved (col. 7, lines 19-39). The rectangular or Hamming window functions (col. 6, eq. 1; col. 7, eq. 2) create blocks out of the signals to be received as they are applied. The blocks that are not selected are not further processed by the system. Therefore, it would have been obvious for one of ordinary skill in the art at the time which the invention was made to utilize a window function as taught by Yonge III in the receiver method of Ohkubo in view

of Cahill and in further view of Mourot because it would further aid the system to make correct symbol decisions.

13. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohkubo in view of Cahill, in further view of Mourot, and in further view of Godwin (US 4620069; hereafter "Godwin").

Regarding claim 8, Ohkubo in view of Cahill and in further view of Mourot disclose the limitations of claim 6 as applied above. Ohkubo in view of Cahill and in further view of Mourot do not disclose that the Fourier transform is computed by using a Goertzel function (fig. 7; col. 18, lines 29-44). However, Godwin teaches the advantages of using the Goertzel function in place of a Fourier transform. Godwin teaches that the advantages are ease of implementation in a microprocessor or DSP and that it requires no complex multiplications (col. 18, lines 39-44). Therefore, it would have been obvious for one of ordinary skill in the art at the time which the invention was made to utilize the Goertzel function in place of the Fourier transform as taught by Godwin in the receiver method of Ohkubo in view of Cahill and in further view of Mourot because it is easier to implement in a DSP and requires no complex multiplications.

Allowable Subject Matter

14. Claims 9-11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Particularly, claim 9 contains subject matter which has not been found to be anticipated or obvious in view of the prior art.

Conclusion

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M Perilla whose telephone number is (703) 305-0374. The examiner can normally be reached on M-F 8-5 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Chin can be reached on (703) 305-4714. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jason M. Perilla
July 1, 2004

jmp

STEPHEN CHIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600